Lee Reynolds

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Senior HPC Architect with 11 years' experience creating and improving Linux HPC clusters. 25 years' experience as Linux site reliability engineer and DevOps specialist. Strong programming background with proven ability to quickly create customized solutions to complex problems using multiple programming and scripting languages.

Top Skills / Technologies

- Linux HPC Cluster Design
- Slurm Scheduler Customization
- BeeGFS Filesystem Administration
- Linux System Administration
- Idempotent Bash Development
- Ansible
- Automated Configuration Management
- Secure C/C++ Development
- Perl, Python
- MySQL, PostgreSQL
- PHP Web Development
- Git, Github, Gitlab
- Docker, Singularity
- Nagios
- OpenVAS / Nessus

EXPERIENCE

Senior HPC Linux Clusters Engineer September 2021 - Present
Oak Ridge National Laboratory, Oak Ridge, TN

My efforts here at ORNL are split evenly between the NCCS and Cades teams.

Major Duties and Responsibilities:

- Work with the NCCS and Cades teams to define and implement best practices and standards within the organization
- Automate systems administration tasks utilizing open-source configuration management tools
- Assist with designing, building, and maintaining HPC Linux systems
- Tune operating systems and applications to increase performance and reliability of services
- Diagnose system operational problems quickly and effectively
- Document system administration procedures for routine and complex tasks
- Coordinate with vendors to resolve hardware and software problems

Senior Research Computing Architect May 2019 – September 2021
ASU Research Computing, Tempe, AZ

Responsible for the design, implementation, and maintenance of the Agave HPC cluster:

- 21,000+ CPU Cores spread across a heterogeneous set of node brands and types including Intel x86_64 (Broadwell, Skylake, Cascade Lake), Xeon PHI KNL, and AMD Epyc (Naples) architectures.
- 350 GPUs (Nvidia 1080, 2080, 3080, K40, K80, A100, V100)
- OS: Centos 7.x

- Infiniband and Omnipath high speed interconnects
- 1.2 PB BeeGFS parallel storage system operating over three fabrics : Infiniband, Omnipath, and 10gb Ethernet
- NFS for /home directories and shared software package directories
- Cobbler based node provisioning
- Leverages university provided LDAP+Kerberos based single sign on identity management system for user authentication.

My duties and achievements include:

- Acting as a guide and mentor for junior DevOps engineers
- Working with researchers and students to help them use the cluster more effectively
- The creation and maintenance of a custom RPM based Slurm scheduler with personally developed patches and a custom database schema which provides fine grained usage metrics similar to that of Moab scheduler's Gold accounting system.
- Creation of a PHP based web front end for Slurm to enable easy monitoring of node states, job status information, and customer usage reporting.
- Maintenance of a personally designed configuration management system based on idempotent bash scripts, developed over the past 20 years, which enables us to support many disparate node types and configurations within a single cluster.
- Leading the effort to recreate this configuration management system using Ansible playbooks.
- Maintenance of our Software Module system with personally developed database augmentation to provide per-user software usage metrics.
- Maintenance of our software stack using both locally developed bash based build scripts and community sourced Spack based build scripts.
- Contributing code and expertise to Dell's Omnia initiative which is creating an Ansible based playbook to enable the rapid deployment of Slurm and Kubernetes clusters onto bare metal systems and within cloud environments.
- Maintenance of Nagios monitoring system utilizing personally written custom alert plugins.
- Keeping our systems secure and up to date through proactive OS updates, which run daily, and regular scans of our systems for security issues through OpenVAS.
- Contributing to the refinement and maintenance of the ASRE High Security / HIPAA computing environment.

Systems Analyst Principal Mar 2010 - May 2019
ASU Research Computing, Tempe, AZ

- Led efforts to transform the Saguaro HPC cluster from a manually managed and inconsistent environment to a fully automated and explicitly defined environment based upon DevOps principles
- Designed and implemented the Ocotillo HPC cluster which utilized a condo model to allow researchers and academic units to purchase privileged access to cluster resources.
- Created database backed process monitoring and notification system for our login nodes which sends students and their faculty sponsors email notifications whenever an inappropriately heavy process is run on a login node instead of a compute node.

Tech Support Analyst Jun 2003 - Mar 2010
Arizona State University, Tempe, AZ

- Linux/Unix IT consultant for faculty within the Computer Science department

- Maintained a diverse collection of over 500 independent Linux and Unix systems for the College of Engineering using a personally created centralized management system which performed the following functions:
    - Network based installation of RHEL and Centos Linux
    - Configuration management
    - Automated deployment of patches and updates
    - Automated firewall configuration and testing
    - User management leveraging centralized Kerberos authentication

- Created a database backed Nessus automated security scanning appliance which helped identify security vulnerabilities and compromised systems within College of Engineering networks.

Tech Support Analyst Associate Apr 2000 - Jun 2003
Arizona State University, Tempe, AZ

- Helpdesk Operation and Datacenter Monitoring
- Replaced manual checking of datacenter systems with Nagios based automated monitoring and reporting.

EDUCATION

Bachelor of Science (B.S.) - Information Technology May 2021 - May 2023 (Expected)
Northern Arizona University, Flagstaff, AZ

Associate of Applied Science (A.A.S.) – Computer Programming 2013 - 2016
Mesa Community College, Mesa, AZ
Topics Studied:

- Java
- C++
- C#
- Computer Networks
- Web Development
- Database Development

Phi Theta Kappa honor society

Computer Science (No degree awarded) 1996 - 2017
Arizona State University, Arizona
Topics Studied:

- Computer Architecture
- Assembly Language (x86, MIPS, 68HC11)
- C/C++
- Java
- Data Structures and Algorithms
- Digital Logic
- Unix System Programming

Independent Study - Computer Science
Coursera

- Accelerated Computer Science Fundamentals Specialization (University of Illinois at Urbana-Champaign)
- Unordered Data Structures (University of Illinois at Urbana-Champaign)
- Object-Oriented Data Structures in C++ (University of Illinois at Urbana-Champaign)
- Ordered Data Structures (University of Illinois at Urbana-Champaign)
- Fundamentals of Parallelism on Intel Architecture (Xeon PHI C++ Programming)

Independent Study - Computer Science
Linkedin Learning

- Advanced SQL for Data Scientists
- Secure Coding in C
- DevOps Foundations

- Learning Ansible
- C: Data Structures, Pointers, and File Systems
- Python Essential Training

HONORS & AWARDS

Employee Dedication Award (finalist) 2019
Arizona State University

References

Available upon request.